

Exposure to polycyclic aromatic hydrocarbons in atmospheric PM 1.0 of urban environments: Carcinogenic and mutagenic respiratory health risk by age groups

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Abstract

We investigated the carcinogenic and mutagenic respiratory health risks related to the exposure to atmospheric PAHs in an urban area. Our study focused in the association of these pollutants and their possible effect in human health, principally respiratory and circulatory diseases. Also, we determined a relationship between the inhalation risk of PAHs and meteorological conditions. We validated the hypothesis that in winter PAHs with high molecular weight associated to submicron particles (PM1) may increase exposure risk, especially for respiratory diseases, bronchitis and pneumonia diseases. Moreover, in our study we verified the relationship between diseases and several carcinogenic PAHs (Ind, BbKf, DahA, BaP, and BghiP). These individual PAHs contributed the most to the potential risk of exposure for inhalation of PM1.0. Even at lower ambient concentrations of BaP and DahA in comparison with individual concentrations of other PAHs associated to PM1.0. Mainly, research suggests to include carcinogenic and mutagenic PAHs in future studies of environmental health risk due to their capacity to associate to PM10. Such carcinogenic and mutagenic PAHs are likely to provide the majority of the human exposure, since they originate from dense traffic urban areas where humans congregate.

Keywords

Atmospheric pollution, Carcinogenic health risk, PAHs, PM1